

MIL-R-81217(WP)
1 February 1966

MILITARY SPECIFICATION

RADIO SET AN/ARC-101(*)

This specification has been approved by the
Bureau of Naval Weapons, Department of the Navy.

1. SCOPE

1.1 Scope - The equipment covered by this specification shall function as an airborne VHF communications system consisting of a transmitter and receiver capable of transmission and reception of VHF radio intelligence by means of amplitude-modulated radiotelephone. The equipment shall include a remote control unit for operational control of the transmitter and receiver. The equipment shall also be capable of transmission and reception of air traffic control signalling system (ATCSS) visual communications intelligence. Also, in conjunction with other equipment, the receiver shall be capable of functioning as a visual omnirange (VOR) and localizer receiver in the 108.00-mc to 117.95-mc band.

1.2 Classification - The Radio Set AN/ARC-101 shall consist of the following items:

<u>Items</u>	<u>Type Designation</u>	<u>Appl. Para.</u>
Transmitter, Radio	T-907(*)/ARC-101	3.4.1
Receiver, Radio	R-1185 A /ARC-101	3.4.2
Control, Radio Ser	C-4616(*)/ARC-101	3.4.3
Mounting	MT-2248(*)/ARC-84	3.4.4
Mounting	MT-3597(*)/ARC-101	3.4.5
Power Supply (DC Rcvr) and	PP-2448(*)/ARC-84	3.4.6
Power Supply (DC Trans) or	PP-2449(*)/ARC-84	3.4.7
Power Supply (AC Trans) and	PP-2687(*)/ARC-84	3.4.8
Power Supply (AC Rcvr)	PP-2688(*)/ARC-84	3.4.9

2. APPLICABLE DOCUMENTS

2.1 General - The following documents of the issue in effect on the date of invitation for bids form a part of this specification to the extent specified herein.

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SPECIFICATIONS

Military

MIL-E-4682	Electron Tubes and Transistors, Choice and Application of
MIL-W-5088	Wiring; Aircraft, Installation of
MIL-E-5400	Electronic Equipment, Aircraft, General Specification for
MIL-T-5422	Testing, Environmental, Aircraft Electronic Equipment
MIL-C-6781	Control Panel; Aircraft Equipment, Rack or Console Mounted
MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of
MIL-T-18303	Test Procedures; Preproduction and Inspection, For Aircraft Electronic Equipment, Format for
MIL-N-18307	Nomenclature and Nameplates for Aeronautical Electronic and Associated Equipment
MIL-STD-781	Reliability Tests, Experimental Distribution

STANDARDS

Military

MIL-STD-704	Electric Power, Aircraft Characteristics and Utilization of
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2.2 Availability of Documents -

- (1) When requesting specifications, standards, drawings, and publications, refer to both title and number. Copies of this specification and applicable specifications required by contractors in connection with specific procurement functions may be obtained upon application to the Commanding Officer, Naval Supply Depot, Code 105, 5801 Tabor Avenue, Philadelphia 20, Pennsylvania 19120.

3. REQUIREMENTS

3.1 Parts and Materials - In the selection of parts and materials fulfillment of major design objectives shall be the prime consideration. In so doing, the following shall govern:

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- (1) Parts and materials requirements shall conform to Specification MIL-E-5400.
- (2) Nonrepairable subassemblies, as outlined in Specification MIL-E-5400, shall be used when practicable. The general size of the subassembly and the amount of circuitry to be included therein shall be approved by the procuring activity. Nonrepairable subassemblies must be reliable. (See 6.3)
- (3) When previously produced models of this equipment did not use nonrepairable subassemblies, the design shall not be changed to employ nonrepairable assemblies without the approval of the procuring activity.

3.1.1 Nonstandard Parts and Material Approval - Approval for the use of nonstandard parts and materials shall be obtained as outlined in Specification MIL-E-5400.

3.1.2 Electron Devices - Electron tubes, transistors and diodes shall be chosen and applied as outlined in Specification MIL-E-4682.

3.2 Design and Construction - The equipment shall conform with all applicable requirements of Specification MIL-E-5400 for design, construction, and workmanship, except as otherwise specified herein.

3.2.1 Total Weight - The total weight of the equipment, excluding cables, shall be a minimum consistent with good design and shall not exceed 27.1 pounds with the PP-2449/ARC-84 power supply installed in the transmitter and 28.1 pounds with the PP-2687/ARC-84 power supply installed in the transmitter.

3.2.2 Reliability -

3.2.2.1 Operational Stability - The equipment shall operate with satisfactory performance, continuously or intermittently for a period of at least 5000 hours without the necessity for readjustment of any controls which are inaccessible to the operator during normal use, provided no maintenance was required.

3.2.2.2 Operating Life - The equipment shall have a total operating life of 40,000 hours with reasonable servicing and replacement of parts. Information on parts requiring replacement within this interval and the wear-out life of such parts as determined by the contractor shall be submitted to the procuring agency.

3.2.2.3 Reliability in Mean Time Between Failures (MTBF) - For purposes of the reliability test specified in Section 4, the equipment shall have a mean time between failures of 150 hours.

3.2.3 Cabling and Connections

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3.2.3.1 Cables and Connectors - The equipment shall provide for the use of cables and connectors in accordance with Specification MIL-E-5400 except for the requirement of maintaining a specified minimum of spare (unused) contacts per connector.

3.2.3.2 Interconnection Cabling - The equipment shall be capable of satisfactory operation using external wiring in accordance with the applicable requirements of Specification MIL-W-5088. The external wiring shall be unshielded, except that a minimum number of the individual wires may be shielded when demonstrated as necessary to meet interference control requirements, and provided the assembly of the cable to its plugs may be easily accomplished. External cables shall not be supplied as part of the equipment.

3.2.4 Control Panels - All rack or console mounted control panels shall conform to the applicable requirements of Specification MIL-C-6781. The configuration of all control panels must be approved by the procuring activity prior to preproduction testing.

3.2.5 Interchangeability of Reordered Equipment - For reordered equipment interchangeability shall exist between units and all replaceable assemblies, subassemblies, and parts of a designated model of any previously manufactured equipment, supplied or designated by the procuring activity.

3.2.6 Interference Control - The generation of radio interference by the equipment and the vulnerability of the equipment to radio interference shall be controlled within the following limits:

3.2.6.1 Transmitter Spurious Radiation - With a 2500-cps signal applied as input to the transmitter having a peak level at least 16 db above that level which produces 50% modulation, radiation at frequencies outside the band +25 kc from the assigned carrier shall be controlled as follows:

- (1) The transmitter output power, on discrete frequencies within the bands from +25 kc to +50 kc from the assigned carrier frequency and from -25 kc to -50 kc from the assigned carrier frequency, shall be 25 db or more below the output power, and in no case more than 125 milliwatts.
- (2) The transmitter output power on discrete frequencies outside the band +50 kc from the assigned carrier frequency shall be below the mean output power by at least $43 + 10 \log$ (output power in watts) db.

3.2.6.2 Transmitter Susceptibility - With a test signal applied, the residual noise on the carrier shall be at least 30 db below the level of the unmodulated carrier.

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3.2.6.3 Receiver Spurious Radiation - The emission of radio-frequencies within the range of 90 kc to 1500 mc shall not exceed:

- (1) Between any cable terminal and ground, 200 microvolts.
- (2) At the antenna input terminal, across a resistive load equal to the source impedance for which the receiver is designed, 400 micro-microwatts.

3.2.6.4 Receiver Susceptibility - The level of an input signal required to produce rated output shall be at least 80 db greater than that required to produce rated output at the frequency of maximum response when the frequency is varied over the range of 90 kc to 1500 mc excluding the frequencies for which the receiver is designed. Within the range of frequencies for which the receiver is designed (except for assigned frequency ± 10 mc), the level required to produce rated output shall be at least $+70$ db greater than that required to produce rated output at the frequency of greatest response.

3.2.7 Maintenance Provisions and Field Testing - Provisions for maintenance shall be as specified in Specification MIL-E-5400. Specific test points and test facilities shall be provided to the greatest extent practicable for ease of field testing and maintenance, but these facilities need not necessarily be available on the outer case. In location and mounting of component parts, consideration shall be given to accessibility for ease in maintenance of the equipment. A removable type of plug-in construction shall be incorporated for any subassembly that might otherwise be difficult to service properly.

3.2.8 Nomenclature and Nameplates - Nomenclature assignment and nameplate approval for equipment identification shall be in accordance with Specification MIL-N-18307.

3.2.9 Standard Conditions - The following conditions shall be used to establish normal performance characteristics under standard conditions and for making laboratory bench tests.

Temperature	Room ambient ($25^{\circ}\text{C} \pm 5^{\circ}\text{C}$)
Altitude	Normal ground
Vibration	None
Humidity	Room ambient up to 90% relative humidity
Input power voltage	$115 \pm 1.0\text{V}$ AC and $27.5 \pm 0.5\text{V}$ DC

3.2.10 Service Conditions - The equipment shall operate satisfactorily under any of the environmental service conditions or reasonable combination of these conditions as specified in Specification MIL-E-5400 for Class 1 equipment, except as modified herein:

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3.2.10.1 Vibration - The equipment shall operate satisfactorily when subjected to the vibration requirements of Curves II and IV of Specification MIL-E-5400.

3.2.10.2 Altitude - The equipment shall operate satisfactorily at any altitude between sea level and 55,000 feet.

3.2.10.3 Temperature - The equipment shall operate satisfactorily in any ambient temperature within the range of -40°C to $+55^{\circ}\text{C}$.

3.2.11 Warm-Up Time - The time required for the equipment to warm up prior to operations shall be kept to a minimum and shall not exceed 5 minutes under all service conditions.

3.2.12 Primary Input Power Requirements - The equipment shall meet all applicable requirements of MIL-STD-704 and shall give specified performance from the following power sources with characteristics as defined in MIL-STD-704 having limits as specified therein. The power required shall not exceed the specified amounts.

(1) AC power (Single Phase) 115V, Category "B", 156 VA

(2) DC power 28V, Category "B", 9.5 Amps (13 Amps during frequency channeling).

3.2.12.1 Degraded Performance - Degraded performance will be permitted for voltage transients not exceeding 0.5 second during normal electric system operation. Operation shall return to normal with no resulting damage to equipment.

3.2.13 Standby Provisions - The equipment shall provide for a standby position whereby rated voltage shall be applied to all tube filaments. Except for the associated filament circuits, voltages shall not be applied to other parts of the equipment.

3.3 Performance - Unless otherwise specified, values set forth to establish the requirements for satisfactory performance apply to performance under both standard and extreme service conditions. When reduced performance under the extreme conditions is acceptable, tolerances or values setting forth acceptable variations from the performance under the standard conditions will be specified.

3.3.1 Operation - The equipment shall provide for VHF Communications in the 108.00- to 151.95-mc band in receive, and 116- to 149.95-mc in transmit.

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3.3.2 Channels - The equipment shall transmit on 680 channels, spaced 50-kc apart, in a frequency range of 116- to 149.95-mc and shall receive on 880 channels, spaced 50 kc apart over a frequency of 108- to 151.95-mc band.

3.3.3 Output Power - Under the following frequency ranges and conditions, the amplitude modulated rf output power (carrier) shall be:

<u>Frequency Range (MC)</u>	<u>Conditions</u>	<u>Watts</u>
115 to 137.95	Standard	25
138 to 149.95	Standard	20
116 to 137.95	Extreme Service	17
138 to 149.95	Extreme Service	14

3.3.4 Duty Cycle - The transmitter shall have a duty cycle of five minutes on and five minutes off. The receiver shall be capable of continuous operation.

3.3.5 Internal Power Supplies - The transmitter and receiver shall have provisions for operating with either ac or dc plug-in power supplies.

3.3.6 Remote Control - Receiver squelch, volume, and equipment operating frequency shall be remotely controlled from the control unit.

3.4 Detail Requirements -

3.4.1 Transmitter, Radio T-907/ARC-101 - The transmitter shall meet the following requirements:

3.4.1.1 Function - The transmitter shall generate rf power and transmit it with the performance requirements specified in 3.4.1.7.

3.4.1.2 Form Factor - The transmitter form factor and dimensions shall be in accordance with Figure 1.

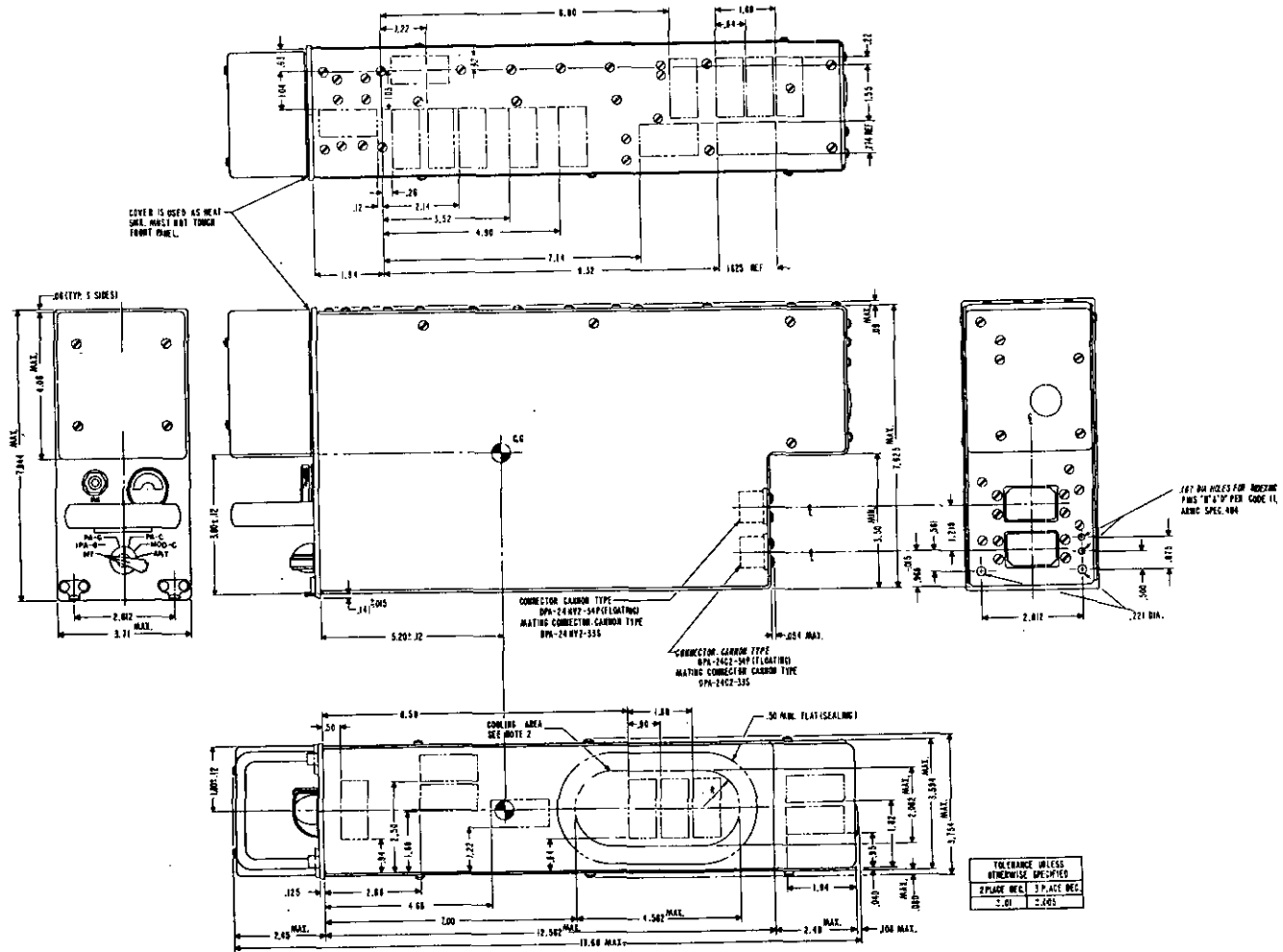
3.4.1.3 Weight - The weight of the transmitter without the power supply shall not exceed 12.6 pounds.

3.4.1.4 Contents of Unit - The transmitter shall contain the necessary circuitry to perform the required functions.

3.4.1.5 Controls -

3.4.1.5.1 DBL-G, IPA-G, PA-G, PA-C, MOD-C, ANT Switch - A six-position rotary switch shall be located on the front panel of Radio Transmitter T-907/ARC-101 to be used for connecting the current meter, also located on the front panel, to the various circuits of the transmitter for checking during normal operation.

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3.4.1.5.2 The following adjustable controls shall be accessible with the transmitter removed from its case:

3.4.1.5.2.1 CLIP - The CLIP control shall set the audio level applied to the clipping circuit.

3.4.1.5.2.2 GAIN- The GAIN control shall establish the overall gain of the modulator.

3.4.1.5.2.3 SIDETONE CONTROL - The SIDETONE control shall set the level of the audio voltage applied to the base of the sidetone amplifier.

3.4.1.6 Electrical Connections - Connections to external circuits shall be provided as follows:

Reference	Receptacle	
<u>Designation</u>	<u>Type</u>	<u>Function</u>
P1	Cannon Electric Co. part no. DPA-24HV2-34P-022000-0022 or approved equivalent	Control and power inlet
P2	Cannon Electric Co. part no. DPA-24C2-34P-022000-0004 or approved equivalent	Control and power inlet and transmitter outputs
J101(TP1)	Selectro Corp. part no. SKT-5BC (white) or approved equivalent	Facilitates monitoring of whole-megacycle crystal frequency of the high frequency oscillator
J1C2 (TP2)	Selectro Corp. part no. SKT-5BC (white) or approved equivalent	Facilitates monitoring of fractional-megacycle crystal frequency of the low frequency oscillator
J301 (TP3)	Selectro Corp. part no. SKT-5BC (white) or approved equivalent	Facilitates monitoring of sidetone output
J302 (TP4)	Selectro Corp. part no. SKT-5BC (white) or approved equivalent	Facilitates monitoring of regulated voltage output of surge and ripple suppressor
J201 (TP5)	Selectro Corp. part no. SKT-5BC (white) or approved equivalent	Facilitates monitoring the input to the 2nd rf amplifier

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J1	Military Type JJ-33 per Military Specification MIL-J-641/5A	Marked MIC for micro- phone connection to the transmitter for test purposes
J2	Continental Connector Corp. part no. SM20-20S or approved equivalent	Plug-in power supply inlet and power supply outputs to transmitter circuits

3.4.1.7 Transmitter Performance Requirements -

3.4.1.7.1 Frequency Range - The transmitter shall have a frequency range of 116.00 MC to 149.95 MC.

3.4.1.7.2 Channels - The transmitter shall have 680 channels spaced 50 kc apart.

3.4.1.7.3 Input Impedance - The transmitter input impedance to the microphone shall be 100 ohms and to the ATCSS signals, approximately 150 ohms.

3.4.1.7.4 Output Impedance - The transmitter output impedance to the antenna shall be 52 ohms.

3.4.1.7.5 Output Power - Under the following frequency ranges and conditions, the minimum amplitude modulated rf output power (carrier) shall be:

<u>Frequency Range (MC)</u>	<u>Conditions</u>	<u>Watts</u>
116 to 137.95	Standard	25
138 to 149.95	Standard	20
116 to 137.95	Extreme Service	17
138 to 149.95	Extreme Service	14

3.4.1.7.6 Channeling Time - The time elapsed between the instant the channel selector switch is positioned to select a given channel and the instant the transmitter is in an operative condition on the selected channel shall be not greater than four seconds.

3.4.1.7.7 Frequency Stability - The transmitter frequency shall not vary more than +0.005% over a temperature range of -10°C (+14°F) to +70°C (+158°F) and not more than +0.007% over a temperature range of -40°C (-40°F) to +70°C (+158°F).

3.4.1.7.8 Modulation Capability - With a sine wave input to the microphone transformer of 0.25 volt rms at 1000 cps, or with a sine wave ATCSS input of not more than 1.5 volts rms at 1000 cps, the modulator shall be capable of modulating the rf carrier 85%. Modulation capability shall not be less than 70 percent at -40°C.

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3.4.1.7.9 Modulator Frequency Response - At 85% modulation, the modulator frequency response shall be flat within 6 db from 350 cps to 3500 cps for a microphone input signal and flat within 6 db from 300 cps to 10,000 cps for an ATCSS input signal.

3.4.1.7.10 Audio Frequency Distortion - With a microphone input of 1000 cps, the CLIP control shall be set such that the signal is on the threshold of clipping, and GAIN control set for 85% modulation, the audio frequency distortion shall not exceed 15%. With a microphone input from 350 to 2500 cps and CLIP and GAIN controls at previous settings, the audio frequency distortion shall not exceed 25%.

3.4.1.7.11 Sidetone Output - With 85% modulation at 1000 cps, the transmitter shall deliver a minimum of 100 milliwatts of rectified carrier sidetone signal into a 500-ohm load. The sidetone output shall be flat within 10 db from 350 to 2500 cps.

3.4.1.7.12 Speech Clipping - With a microphone input of 0.25 volts rms at 1000 cps, the CLIP control shall be set such that the signal is on the threshold of clipping, and GAIN control shall be set for 85% modulation, the input signal shall be able to be increased a minimum of 10 db with total distortion not exceeding 25%.

3.4.1.7.13 Carrier Noise Level - The signal plus noise level shall be down at least 40 db at 85% modulation.

3.4.1.7.14 Transient Voltage Protection - The transmitter shall be protected to withstand a minimum of a 100-millisecond transient of +80 volts on the dc source.

3.4.2 Receiver, Radio R-1185A/ARC-101 - The receiver shall meet the following requirements:

3.4.2.1 Function - The receiver shall provide reception of radio signals in accordance with the performance requirements specified in paragraph 3.4.2.7.

3.4.2.2 Form Factor - The receiver form factor and dimensions shall be in accordance with Figure 2.

3.4.2.3 Weight - The weight of the receiver without the power supply shall not exceed 8.88 pounds.

3.4.2.4 Contents of Unit - The receiver shall contain the necessary circuitry to perform the required functions.

3.4.2.5 Controls -

3.4.2.5.1 SQUELCH TEST - A push-to-test type switch shall be located on the front panel of Radio Receiver to permit disabling of the squelch circuit for test purposes.

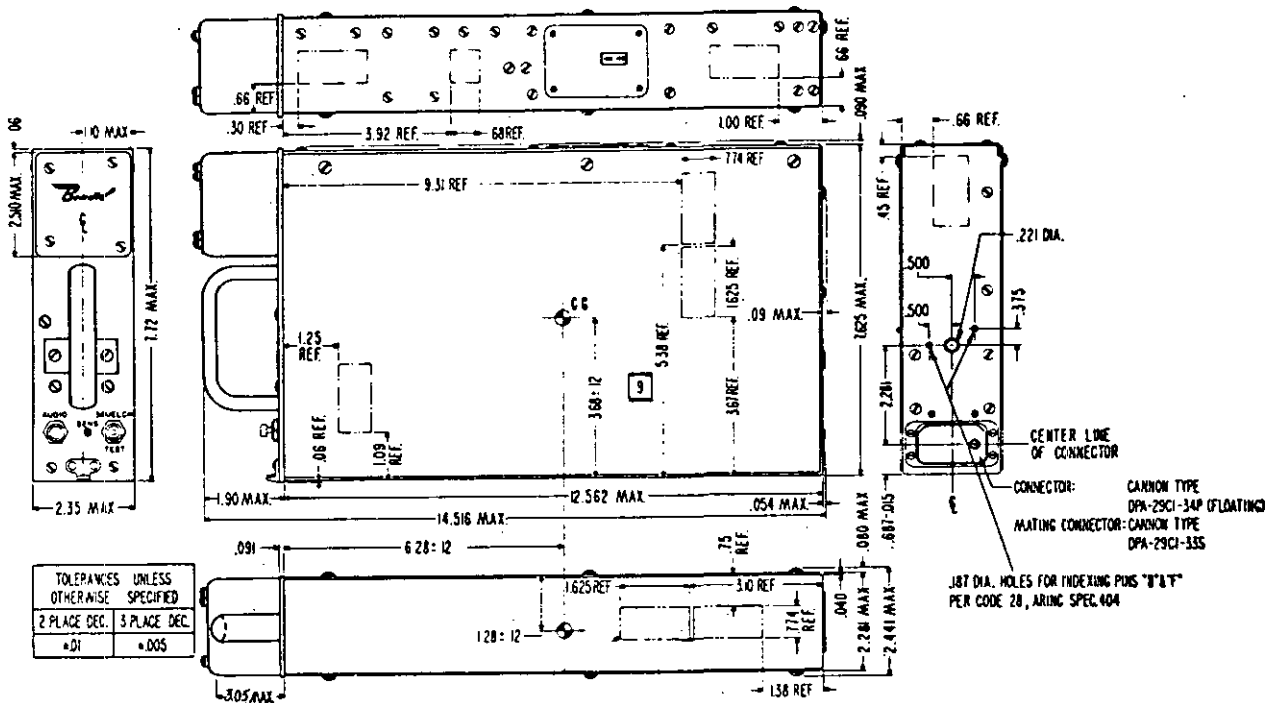


Figure 2. Receiver, Radio R-1185A/ARC-101, Outline Dimensions

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3.4.2.5.2 SENS (Sensitivity) - An adjustable control shall be located on the front panel of Radio Receiver R-1184/ARC-101 to permit the setting of the squelch level.

3.4.2.5.3 The following adjustable controls shall be accessible with the receiver removed from its case:

3.4.2.5.3.1 An avc delay control to set the level of the avc circuit

3.4.2.5.3.2 A volume control to set the audio output level.

3.4.2.6 Electrical Connections - Connections to external circuits shall be provided as follows:

<u>Reference Designation</u>	<u>Receptacle Type</u>	<u>Function</u>
P1	Cannon Electric Co. part no. DPA-29C1-34P-022000-0048 or approved equivalent	Control and power inlet and receiver outputs
J2	Continental Connector Corp. part no. SM14-2CS or approved equivalent	Power inlet
J201(TP1)	Sealectro Corp. part no. SKT-5BC(red) or approved equivalent	Facilitates monitoring the output of the first oscillator
J202(TP2)	Sealectro Corp. part no. SKT-5BC (red) or approved equivalent	Facilitates monitoring the whole-megacycle crystal input to the first oscillator
J203(TP3)	Sealectro Corp. part no. SKT-5BC (red) or approved equivalent	Facilitates monitoring the output of the second oscillator
J1	Military type JJ034 per Military Specification MIL-J-641/6A	Marked AUDIO for headphones connection to receiver audio output

3.4.2.7 Receiver Performance Requirements -

3.4.2.7.1 Frequency Range - The receiver shall have a frequency range of 108.00 mc to 151.95 mc in accordance with paragraph 3.3.1.

3.4.2.7.2 Channels - The receiver shall have 880 channels spaced 50 kc apart.

3.4.2.7.3 Input Impedance - The input impedance of the receiver shall be 52 ohms. With a test signal input applied from a slotted line having a 52 ohm characteristic impedance, a measured VSWR shall not exceed 2.5.1.

3.4.2.7.4 Headphone Audio Output - The headphone audio output for navigation channels shall be a minimum of 100 milliwatts into a 500-ohm load with a 3.0 microvolt input signal modulated at 30% and, for communications channels, shall be a minimum of 100 milliwatts into a 500-ohm load with a 3.0 microvolt input signal modulated at 50%.

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3.4.2.7.5 Headphone Audio Output Response - With a 50-microvolt input carrier modulated 50% and the communications output of the receiver set at 100 milliwatts for a 1000-cps modulation frequency, the output shall not vary more than 6 db for any modulation frequency in the 350-cps to 2500-cps range. For all frequencies above 3000 cps, the output shall be down at least 30 db from the response at 1000 cps.

3.4.2.7.6 Navigation and ATCSS Audio Output - The navigation and ATCSS circuitry shall provide a low impedance (1000 ohms) output at a minimum of 0.5 volts rms which is flat from 30 cps to 10 kc within 4 db with a 3.0 microvolt input signal modulated at 30%.

3.4.2.7.7 Channeling Time - The time elapsed between the instant the channel selector switch is positioned to select a given channel and the instant the receiver is in an operative condition on the selected channel shall not be greater than four seconds.

3.4.2.7.8 Frequency Stability - The resonant frequency of the receiver shall not deviate from the selected frequency by more than + 0.005% when the ambient temperature is varied from -10°C (+14°F) to +70°C (+158°F) and not more than +0.007% over a temperature range of -40°C (-40°F) to +70°C (+158°F).

3.4.2.7.9 Sensitivity - The signal-to-noise ratio shall be a minimum of 6 db with a 3.0 microvolt input signal modulated 30% at 1000 cps applied through a 6-db pad.

3.4.2.7.10 Selectivity - The receiver bandwidth corresponding to off-resonance attenuation shall be as follows:

<u>Attenuation</u>	<u>Bandwidth</u>
6 db	40 kc minimum
60 db	72 kc maximum

3.4.2.7.11 Harmonic Distortion - With a 1000-microvolt input carrier modulated by 1000 cps at 30% modulation and the output of the receiver set at a level of 100 milliwatts, the combined harmonic distortion plus noise in the receiver output shall not exceed 10%. With the same input and output level settings and the carrier modulated at 90%, the combined harmonic distortion plus noise in the receiver output shall not exceed 20%. The combined noise and harmonic distortion in the receiver output signal shall not exceed 25% at the rated power output when the receiver input signal is modulated 85%, its level varied over the range from 20 microvolts to 20,000 microvolts, and the modulation frequency varied from 350 to 2500 cps.

3.4.2.7.12 Super Squelch - The super squelch shall be a transistorized carrier operated muting device which provides quieting motion for VHF communication receivers. The super squelch shall operate on the double superheterodyne

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reflex principle and shall be actuated only by bona fide carrier signal which are within the pass band of the associated receiver. This circuit action shall produce 2 kc output signal which is filtered and rectified to produce a control voltage which actuates the radio stages and unscelches the receiver. The super squelch shall be immune to producing false receiver openings due to existance of high electrical noise signal conditions or environments. The super squelch shall permit the receiver to continually and automatically adjust to optimum sensitivity, regardless of the ambient electrical nosie environment. The squelch range shall be capable of muting the receiver output until application of any signal present in the 1-microvolt to 25-microvolt range.

3.4.2.7.13 A 30% modulated undesired signal at a level of 60 db above the desired signal, and removed 100 kc from the selected frequency will not produce an output greater than 10 db below the rated output with the desired signal at a level between 20 and 500 microvolts.

3.4.2.7.14 Automatic Volume Control - The output of the receiver shall not vary more than 1 db for input signals modulated 30% at 1000 cps, ranging in magnitude from 10 microvolts to 50,000 microvolts.

3.4.2.7.15 Receiver-Phase Shift - With the carrier input modulated by 30 cps, the phase shift through the receiver to the NAV output shall be a maximum of $\pm 0.7^{\circ}$.

3.4.2.7.16 Transient Voltage Protection - The receiver shall not be damaged by transient spikes of the following amplitude and duration.

<u>Amplitude</u>	<u>Duration</u>
600 volts	1 microsecond
300 volts	10 microseconds
150 volts	150 microseconds
100 volts	300 microseconds
80 volts	100 milliseconds

3.4.2.7.17 Short Circuit Protection - The receiver shall not be damaged by short-circuits of the regulated +20 volts dc of indefinite periods of time.

3.4.3 Control, Radio Set C-4616/ARC-101 - The control unit shall meet the following requirements:

3.4.3.1 Function - The control unit shall provide the following remote control functions: simultaneous frequency selection of the transmitter and receiver, and squelch and volume on-off control of the receiver.

3.4.3.2 Form Factor - The control unit form factor and dimensions shall be in accordance with Figure 3 and the applicable requirements of Specification MIL-C-6781 for Type I control panels.

3.4.3.3 Weight - The weight of the control unit shall not exceed 1.6 pounds.

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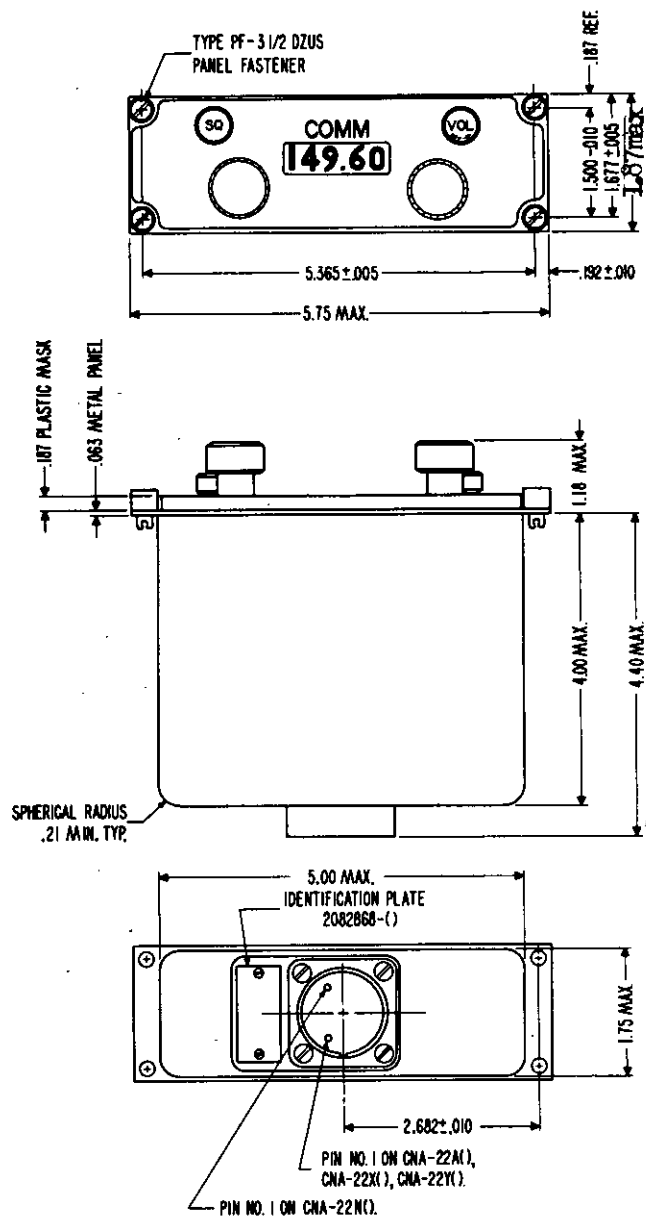


Figure 3. Control, Radio Set, C-4616/ARC-101, Outline Dimensions

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3.4.3.4 Contents of Unit -

3.4.3.4.1 Whole-Megacycle Frequency Selection Circuit - The control unit shall have a front panel whole-megacycle frequency control knob controlling a direct-readout-counter-type frequency indicator. The frequency indicator shall be numbered from 116.00 to 149.95 and the numbers shall appear in increasing sequence as the knob is rotated clockwise. The switch shall select the whole-megacycle operating frequency of the transmitter and receiver to agree with the frequency appearing on the frequency indicator.

3.4.3.4.2 Fractional-Megacycle Frequency Selection Circuit - The control unit shall have a front panel fractional-megacycle frequency control knob controlling a direct-readout-counter type frequency indicator. The frequency indicator shall be numbered from .00 to .95 in increments of .05, and the numbers shall appear in increasing sequence as the knob is rotated clockwise. The switch shall select the fractional-megacycle operating frequency of the transmitter and the receiver to agree with the frequency appearing on the frequency indicator.

3.4.3.4.3 Volume And Power Control Circuit - The control unit shall have a front panel VOL control incorporating an ON-OFF switch which shall be OFF in the extreme counterclockwise position and otherwise on.

3.4.3.4.4 Squelch Control Circuit - The control unit shall have a front panel SQ. (squelch) control potentiometer for adjustment of the squelch level in the receiver.

3.4.3.5 Location of Controls -

3.4.3.5.1 The whole-megacycle frequency control knob shall be mounted on the left side of the control unit front panel.

3.4.3.5.2 The fractional-megacycle frequency control knob shall be mounted on the right side of the control unit front panel.

3.4.3.5.3 A VOL control ON-OFF knob shall be mounted above the fractional-megacycle frequency control knob.

3.4.3.5.4 A squelch control knob shall be mounted above the whole-megacycle frequency control knob.

3.4.3.6 Electrical Connections - Connections to external circuits shall be provided as follows:

<u>Reference Designation</u>	<u>Receptacle Type</u>	<u>Function</u>
J1	Cannon Electric Co. part no. KOA2-21L-50PN or approved equivalent	Power inlet and control unit output

3.4.4 Mounting MI-2248/ARC-84 - The mounting shall meet the following requirements:

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3.4.4.1 Function - The mounting shall function as a support base for T-907(*)/ARC-101 transmitter and R-1185(*)/ARC-101 receiver.

3.4.4.2 Form Factor - The mounting form factor and dimensions shall be in accordance with Figure 4.

3.4.4.3 Weight - The weight of the mounting shall not exceed 2.6 pounds.

3.4.4.4 Electrical Connections - Connections to external circuits shall be provided as follows:

<u>Reference Designation</u>	<u>Receptacle Type</u>	<u>Function</u>
J101	Cannon Electric Co. part no. DPA-29C1-33S or approved equivalent	Receiver output and control and power inlet
J102	Cannon Electric Co. part no. DPA-24HV2-33S or approved equivalent	Transmitter control and power inlet
J103	Cannon Electric Co. part no. DPA-24C2-33S or approved equivalent	Transmitter output and control and power inlet

3.4.5 Mounting MT-3597/ARC-101 - The mounting shall meet the following requirements:

3.4.5.1 Function - The mounting shall function as a support base for T-907(*)/ARC-101 transmitter and R-1185(*)/ARC-101 receiver.

3.4.5.2 Form Factor - The mounting form factor and dimensions shall be in accordance with Figure 5.

3.4.5.3 Weight - The weight of the mounting shall not exceed 2.6 pounds.

3.4.5.4 Electrical Connections - Connections to external circuits shall be provided as follows:

<u>Reference Designation</u>	<u>Receptacle Type</u>	<u>Function</u>
J101	Cannon Electric Co. part no. DPA-29C1-33S or approved equivalent.	Received outputs and control and power inlet.
J102	Cannon Electric Co. part no. DPA-24HV2-33S or approved equivalent.	Transmitter control and power inlet.
J103	Cannon Electric Co. part no. DPA-24C2-33S or approved equivalent.	Transmitter output, and control and power inlet.

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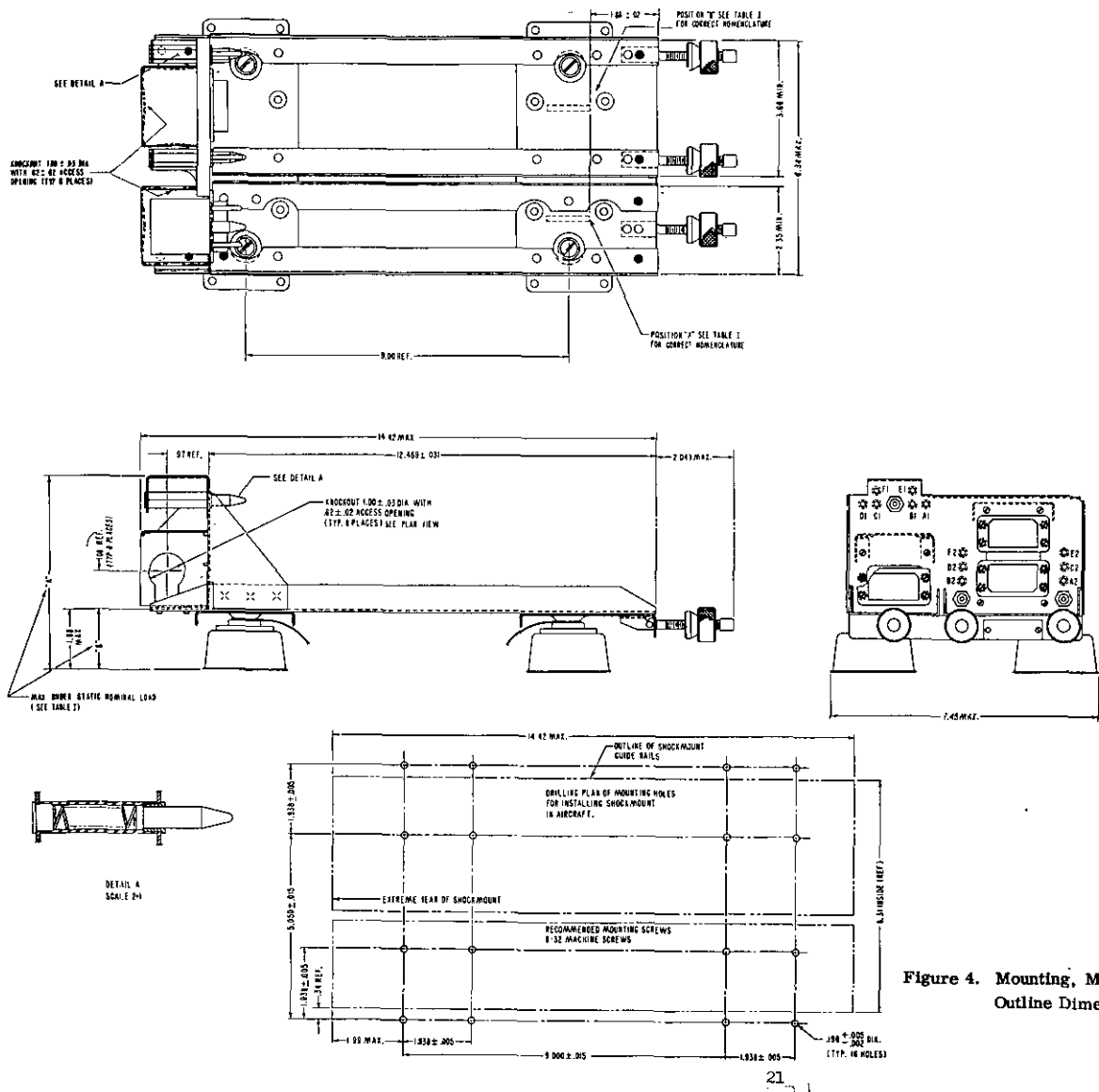


Figure 4. Mounting, MT-2248/ARC-84, Outline Dimensions

TABLE I

MOUNTING		EQUIPMENT USED WITH			CANNON TYPE CONNECTOR			INDEX PINS		DIMENSIONS	
TYPE NO.	WEIGHT	POSITION	TYPE NO.	WEIGHT	LOCATION	POSITION	TYPE NO.	CODE NO.	LOCATION	A	B
MT-3597/ARC-101	2.6 LBS	A	R-1185K/ARC-101	9.0 LBS	BOTTOM	UPRIGHT	DPA-29C1-33S	28	B1,F1	5.03	1.35
		B	T-907K/ARC-101	1.61 LBS	TOP BOTTOM	UPRIGHT INVERTED	DPA-24HV2-33S DPA-24C2-33-S	23	B2,D2		

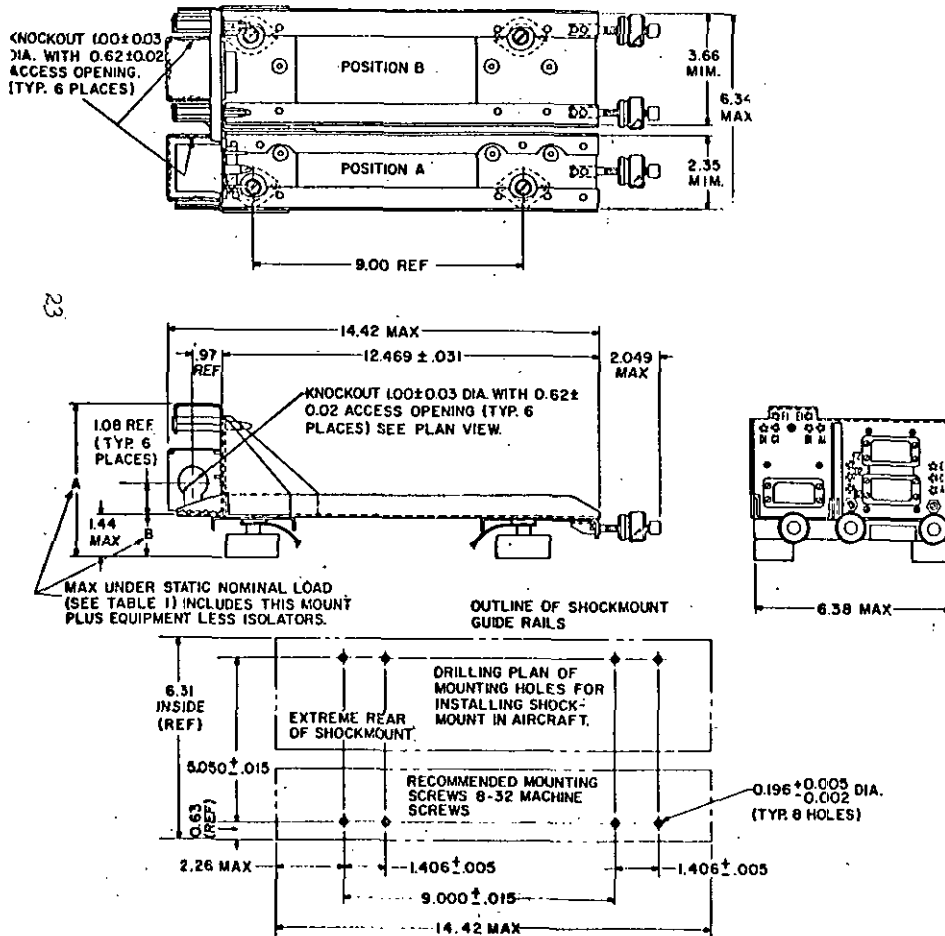


Figure 5. Mounting MT-3597/ARC-101, Outline Dimensions

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3.4.6 Power Supply PP-2448/ARC-84 - The power supply shall meet the following requirements:

3.4.6.1 Function - The power supply shall provide an output to the receiver of +130 volts dc for an input of +19.5 volts dc.

3.4.6.2 Form Factor - The power supply form factor and dimensions shall be in accordance with Figure 6.

3.4.6.3 Weight - The weight of the power supply shall not exceed 0.53 pound.

3.4.6.4 Contents of Unit - The power supply shall contain the necessary circuitry to perform the required functions.

3.4.6.5 Electrical Connections - Connections to external circuits shall be provided as follows:

<u>Reference Designation</u>	<u>Receptacle Type</u>	<u>Function</u>
PI01	Continental Connector Corp. part no. SM14-20P or approved equivalent	Power supply inlet and output

3.4.6.6 Performance Requirements -

3.4.6.6.1 External Power Requirements - The external power requirements of the receiver with Power Supply PP-2448/ARC-84 are as follows:

3.4.6.6.1.1 During normal receiver operation, power consumption shall not exceed 27.5 volts dc at 0.9 ampere.

3.4.6.6.1.2 During channeling operation power consumption shall not exceed 27.5 volts dc at 6.0 amperes (peak).

3.4.6.6.2 +130-Volt Nominal Output - The nominal +130-volt output of the power supply shall be +130 \pm 5.0 volts dc. See 3.4.6.1.

3.4.6.6.3 +130-Volt Output AC Ripple - The ac ripple on the +130-volt output shall not exceed 4.0 volts ac.

3.4.7 Power Supply PP-2449/ARC-84 - The power supply shall meet the following requirements:

3.4.7.1 Function - The power supply shall provide outputs to the transmitter of +500, +250, +25.2, and +12.6 volts dc for an input of +27.5 volts dc.

3.4.7.2 Form Factor - The power supply form factor and dimensions shall be in accordance with Figure 7.

3.4.7.3 Weight - The weight of the power supply shall not exceed 2.5 pounds.

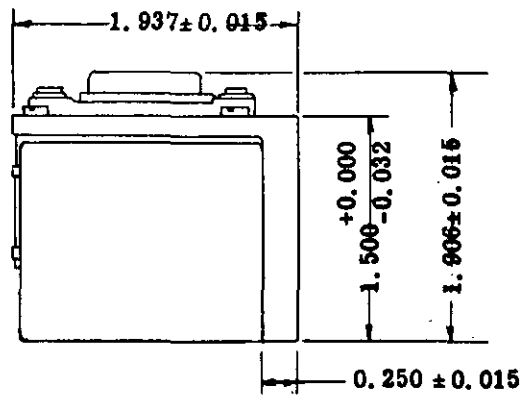
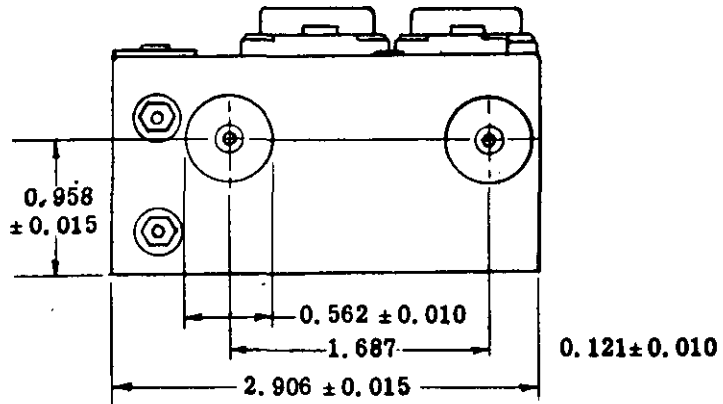


Figure 6 Power Supply PP-2448/ARC-84, Outline Dimensions

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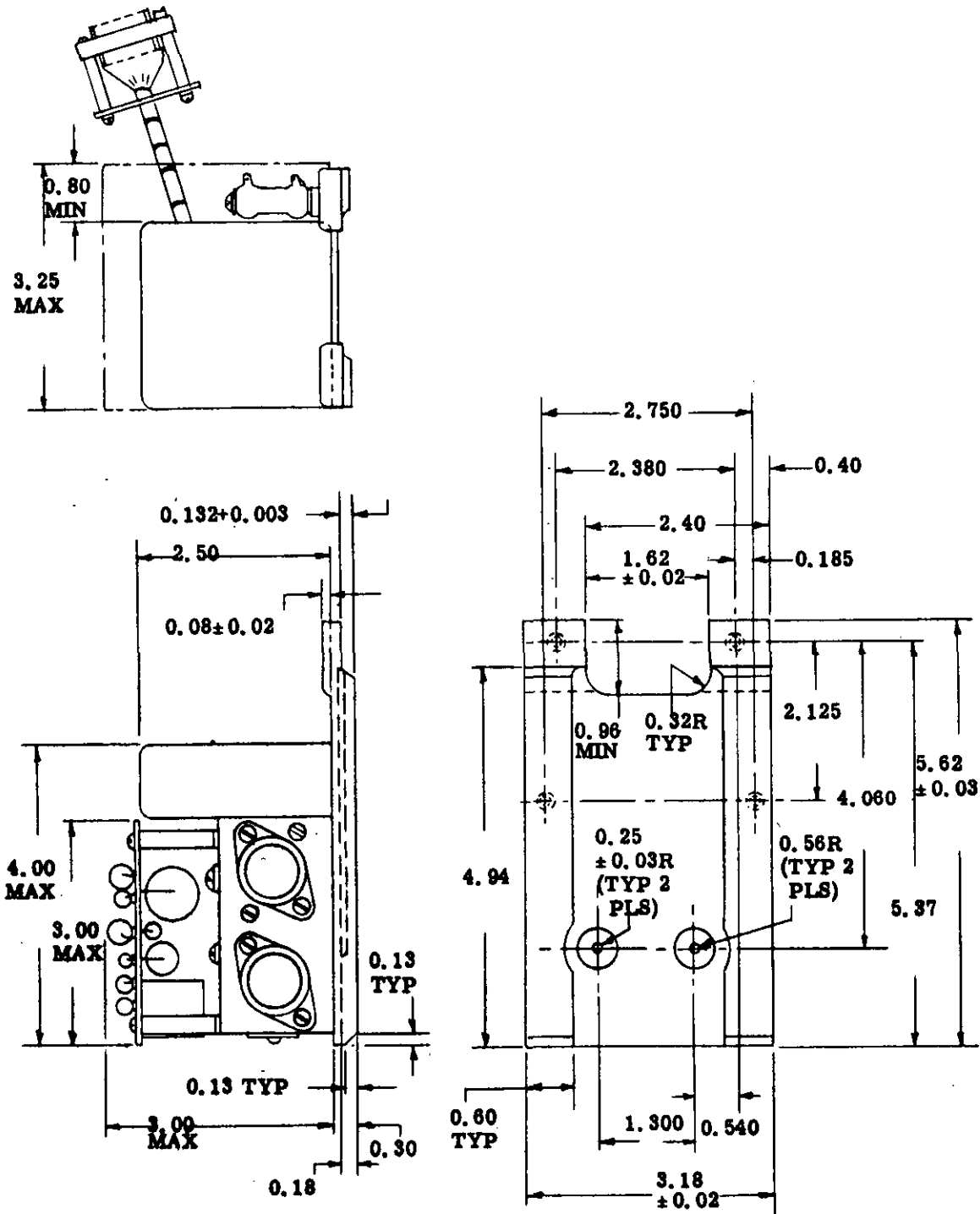


Figure 7. Power Supply PP-2449/ARC-84, Outline Dimensions

3.4.7.4 Contents of Unit - The power supply shall contain the necessary circuitry to perform the required functions.

3.4.7.5 Electrical Connections - Connections to external circuits shall be provided as follows:

<u>Reference Designation</u>	<u>Receptacle Type</u>	<u>Function</u>
P101	Continental Connector Corp. part no. SM20-20P or approved equivalent	Power supply inlet and outputs

3.4.7.6 Performance Requirements -

3.4.7.6.1 External Power Requirements - The external power requirements for the transmitter with Power Supply PP-2449/ARC-84 are as follows:

3.4.7.6.1.1 In standby operation, power consumption shall not exceed 27.5 volts dc at 1.1 amperes.

3.4.7.6.1.2 In transmit operation at 85% modulation, power consumption shall not exceed 27.5 volts dc at 8.35 amperes.

3.4.7.6.1.3 While the transmitter is channeling, power consumption shall not exceed 27.5 volts dc at 6.8 amperes (peak).

3.4.7.6.2 Nominal Voltage Output -

3.4.7.6.2.1 +500-Volt Output - The nominal +500-volt output of the power supply shall be +485 volts dc to +535 volts dc.

3.4.7.6.2.2 +250-Volt Output - The nominal +250-volt output of the power supply shall be +247 volts dc to +273 volts dc.

3.4.7.6.3 AC Ripple -

3.4.7.6.3.1 +500-Volt Output - The ac ripple on the +500-volt output shall not exceed 5.0 volts ac.

3.4.7.6.3.2 +250-Volt Output - The ac ripple on the +250-volt output shall not exceed 2.5 volts ac.

3.4.8 Power Supply PP-2687/ARC-84 - The power supply shall meet the following requirements:

3.4.8.1 Function - The power supply shall provide outputs to the transmitter of +250 and +500 volts dc and 6.3 volts ac for an input of 115 volts ac, 300 cps to 1000 cps.

3.4.8.2 Form Factor - The power supply form factor and dimensions shall be in accordance with Figure 8.

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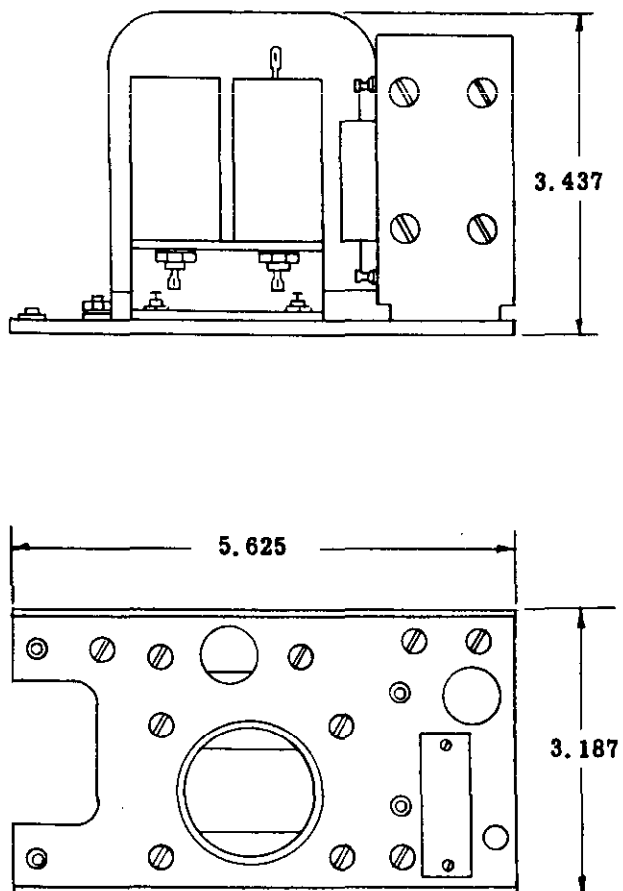


Figure 8 Power Supply PP-2687/ARC-84, Outline Dimensions

3.4.8.3 Weight - The weight of the power supply shall not exceed 3.5 pounds.

3.4.8.4 Contents of Unit - The power supply shall contain the necessary circuitry to perform the required functions.

3.4.8.5 Electrical Connections - Connections to external circuits shall be provided as follows:

<u>Reference Designation</u>	<u>Receptacle Type</u>	<u>Function</u>
F101	Continental Connector Corp. part no. SM20-20PV or approved equivalent	Power Supply inlet and outputs

3.4.8.6 Performance Requirements -

3.4.8.6.1 External Power Requirements - The external power requirements of the transmitter with Power Supply PP-2687/ARC-84 are as follows:

3.4.8.6.1.1 In standby operation, power consumption shall not exceed 115 volts ac, 300 cps to 1000 cps at 19.2 va and a power factor of 0.96.

3.4.8.6.1.2 In transmit operation at 85% modulation, power consumption shall not exceed 27.5 volts dc at 1.8 amperes and 115 volts ac at 150 va and a power factor of 0.84.

3.4.8.6.1.3 While the transmitter is channeling, power consumption shall not exceed 27.5 volts dc at 6.1 amperes (peak).

3.4.8.6.2 Nominal Voltage Output

3.4.8.6.2.1 +500-Volt Output - The nominal +500-volt output of the power supply shall be +485 volts dc to +535 volts dc.

3.4.8.6.2.2 +250-Volt Output - The nominal +250-volt output of the power supply shall be +247 volts dc to +273 volts dc.

3.4.8.6.2.3 6.3-Volt AC Output - The nominal 6.3-volt ac output of the power supply shall be 6.1 volts ac to 6.7 volts ac.

3.4.8.6.3 AC Ripple -

3.4.8.6.3.1 +500-Volt Output - The ac ripple on the +500-volt output shall not exceed 5.0 volts ac.

3.4.8.6.3.2 +250-Volt Output - The ac ripple on the +250-volt output shall not exceed 2.5 volts ac.

3.4.9 Power Supply PP-2688/ARC-84 - The power supply shall meet the following requirements:

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3.4.9.1 Function - The power supply shall provide an output to the receiver of +130 volts dc and 6.3 volts ac for an input of 115 volts ac, 300 cps to 1000 cps.

3.4.9.2 Form Factor - The power supply form factor and dimensions shall be in accordance with Figure 9.

3.4.9.3 Weight - The weight of the power supply shall not exceed 0.6 pound.

3.4.9.4 Contents of Unit - The power supply shall contain the necessary circuitry to perform the required functions.

3.4.9.5 Electrical Connections - Connections to external circuits shall be provided as follows:

<u>Reference Designation</u>	<u>Receptacle Type</u>	<u>Function</u>
F101	Continental Connector Corp. part no. SML4-20P or approved equivalent	Power supply inlet and outputs

3.4.9.6 Performance Requirements -

3.4.9.6.1 External Power Requirements - The external power requirements of the receiver with Power Supply PP-2688/ARC-84 are as follows:

3.4.9.6.1.1 During normal receiver operation power, consumption shall not exceed 115 volts ac, 300 cps to 1000 cps at 0.17 ampere, and 27 volts dc at 0.18 ampere.

3.4.9.6.1.2 During channeling operation, power consumption shall not exceed 27.5 volts dc at 5.4 amperes (peak).

3.4.9.6.2 +130-Volt Nominal Output - The nominal +130-volt output of the power supply shall be +130 \pm 5.0 volts dc.

3.4.9.6.3 6.3-Volt AC Nominal Output - The nominal 6.3-volt ac output shall be 6.3 \pm 0.3 volts ac.

3.4.9.6.4 +130-Volt Output AC Ripple - The ac ripple on the +130-volt output shall not exceed 4.0 volts ac.

3.4.10 Associated Equipment - The equipment shall operate with the following associated equipment which shall not be supplied as part of the AN/ARC-101: CV-2059/ARN-87(V), Converter Navigation Set.

3.5 Design Data - No data is required by this specification (other than reports accompanying samples submitted for testing) or by applicable documents, unless specified in the contract or order (see paragraph 6.6).

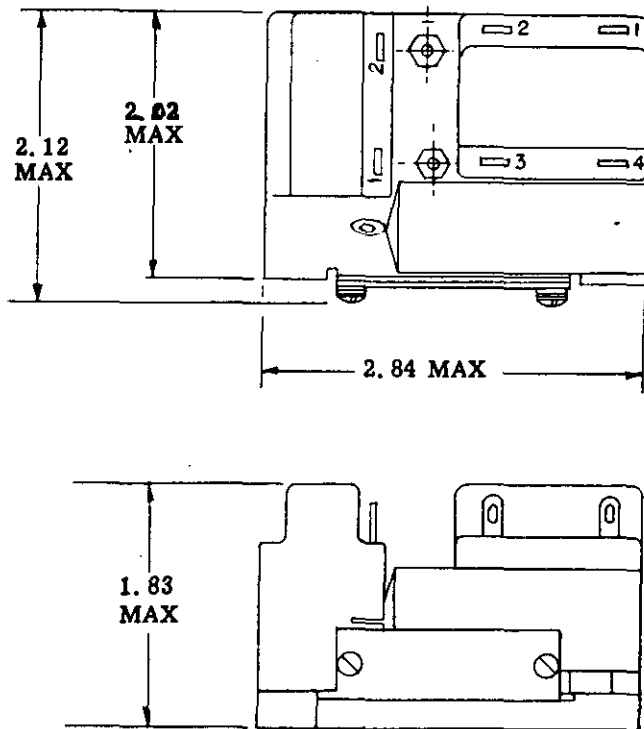


Figure 9 Power Supply PP-2688/ARC-84, Outline Dimensions

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4 QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection - Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Classification of Tests - Items covered by this specification shall be subjected to the following tests to determine compliance with all applicable requirements:

- (1) Preproduction Tests
- (2) Initial Production Tests
- (3) Acceptance Tests
- (4) Life Tests

4.2 Preproduction Tests - Preproduction tests shall be made on an equipment representative of the production equipments to be supplied under the contract. Preproduction tests shall be accomplished under the responsibility of the contractor and shall be conducted in accordance with the approved test procedure of 4.6. The government inspector and the procuring activity shall be advised when tests are to be conducted so that a representative may be designated to witness or supervise the tests when so desired. Contractors not having adequate facilities to conduct all required tests shall obtain the services of a commercial testing laboratory acceptable to the Government.

4.2.1 Preproduction Test Data - The contractor shall submit all data collected in conducting these tests to the procuring agency for review and approval. On first production contracts this data shall include a list of all electrical and electronic parts giving their specified voltage, current and temperature rating and the applied circuit voltage, current and ambient and surface temperatures. The ambient and surface temperature shall be obtained under the extreme high temperature operating condition.

4.2.2 Scope of Tests - Preproduction tests shall include all tests deemed necessary by the procuring activity to determine that the equipment meets all the requirements of this specification and the contract. Preproduction tests shall include environmental tests in accordance with the procedures of Specification MIL-T-5422 and interference tests in accordance with FAA Specification TSO-C36a, Category B, TSO-C37a, Category B, and TSO-36, C40, Category B. However the requirements for certain environmental tests are waived. These are the salt spray, explosion.

4.2.3 Preproduction Approval - Approval of the preproduction sample shall be by the procuring activity upon satisfactory completion of all tests. No production equipments shall be delivered prior to the approval of the preproduction sample. Prefabrication of production equipment prior to the approval of the preproduction sample is at the contractor's own risk. The approved preproduction sample shall be retained by the contractor for his use in the fabrication and testing of equipment to be submitted for acceptance. The preproduction sample shall not be considered as one of the equipments under the contract.

4.2.4 Production Equipments - Equipments supplied under the contract shall in all respects, including design, construction, workmanship, performance and quality, be equivalent to the approved preproduction sample. Each equipment shall be capable of successfully passing the same tests as imposed on the preproduction sample. Evidence of non-compliance with the above shall constitute cause for rejection and for equipment already accepted by the Government, it shall be the obligation of the contractor to make necessary corrections as approved by the procuring activity.

4.3 Initial Production Tests - One of the first 10 production equipments shall be selected and sent at the contractor's expense to a designated Government laboratory for tests. This equipment shall be selected by the procuring activity after the equipment has successfully passed all individual tests. The preproduction sample shall not be selected for this test.

4.3.1 Scope of Tests - This equipment may be subjected to any and all tests the procuring activity deems necessary to assure that the production equipment is equivalent to the previously approved preproduction sample in design, construction, workmanship, performance and quality and that it meets all applicable requirements.

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4.3.2 Accessory Material - In addition to the complete equipment submitted for Initial Production Tests the contractor shall also submit such accessory material and data necessary to test the equipment.

4.3.3 Initial Production Sample Approval - Approval of the Initial Production sample shall be by the procuring activity upon satisfactory completion of all tests. Any design, material or performance defect made evident during this test shall be corrected by the contractor to the satisfaction of the procuring activity. Failure of the Initial Production sample to pass any of the tests shall be cause for deliveries of equipment under the contract to cease until proper corrective action is approved and accomplished. Corrective action shall also be accomplished on equipment previously accepted when requested by the procuring activity.

4.3.4 Reconditioning of Initial Production Test Sample - On completion of the initial production test the equipment shall be reworked by the contractor by replacing all wear or damaged items. After reworking, the contractor shall resubmit the equipment for acceptance.

4.4 Acceptance Tests - The contractor shall furnish all samples and shall be responsible for accomplishing the acceptance tests. All inspection and testing shall be under the supervision of the government inspector. Contractors not having testing facilities satisfactory to the procuring activity shall engage the service of a commercial testing laboratory acceptable to the procuring activity. The contractor shall furnish test reports showing quantitative results for all acceptance tests. Such reports shall be signed by an authorized representative of the contractor or laboratory, as applicable. Acceptance or approval of material during the course of manufacture shall not be construed as a guarantee of the acceptance of the finished product. Acceptance tests shall consist of the following:

- (1) Individual Tests
- (2) Sampling Tests
- (3) Reliability Assurance Tests
- (4) Special Tests

4.4.1 Individual Tests - Each equipment submitted for acceptance shall be subjected to the individual tests. These tests shall be adequate to determine compliance with the requirements of material, workmanship, operational adequacy and reliability. As a minimum, each equipment accepted shall have passed the following tests:

- (1) Examination of Product
- (2) Operational Test
- (3) Manufacturing Run In Test

4.4.1.1 Examination of Product - Each equipment shall be examined carefully to determine that the material and workmanship requirements have been met.

4.4.1.2 Operational Test - Each equipment shall be operated long enough to permit the equipment temperature to stabilize and to check sufficient characteristics and record adequate data to assure satisfactory equipment operation.

4.4.1.3 Manufacturing Run In Test - Each equipment shall be operated under the conditions specified herein for a period of 6 hours without failure. A failure shall be defined as anything which causes malfunctioning of the equipment. Only those adjustments will be permitted which can be made by using such controls and adjustments that are accessible to the operator during the normal use of the equipment.

Temperature	Ambient room
Humidity	Ambient room
Vibration	Any selected frequency within the range of 20 to 30 cps (excluding resonant points) and a minimum amplitude of ± 3 g's

The equipment shall be vibrated (without vibration isolators) for a period of 10 minutes prior to the beginning of the 6-hour period of operation. Where feasible, the equipment shall be operated during this vibration period for the purpose of detecting flaws and imperfect workmanship. Operation within the specified limits of satisfactory performance is not necessarily required during the vibration period. The direction of vibration should be vertical to the normal mounting plane for 5 minutes and lateral to the plane for 5 minutes. Where it is not feasible to vibrate the equipment in 2 directions the vertical direction shall be used. During the 6-hour period of operation following the 10-minute vibration period, the equipment shall be mechanically cycled periodically through its various phases of operation. Should a failure occur, it should be repaired and the test started over, except that the 10-minute vibration period need not be repeated when it is certain the failure was not a result of the vibration. Should repetitive failures occur, corrective action shall be taken to eliminate this defect from future equipment. A record shall be kept of all failures. The 6-hour period specified above may be composed of two 3-hour periods to conform with standard working hours.

4.4.2 Sampling Tests - Equipments selected for sampling tests shall first have passed the individual tests. Equipments shall be selected for sampling tests by the government inspector in accordance with the following: (Sampling tests shall not be conducted unless Reliability Assurance Tests of 4.4.3 are deleted by contractual action.)

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<u>Quantity of Equipments Offered for Acceptance</u>	<u>Quantity to be Selected For Sampling Test</u>
First 10	0*
Next 50	1
Next 75	1
Next 100	1
	1 for each additional 200 or fraction thereof

*NOTE: If by contractual action the Initial Production Test (4.3) is deleted, then a Sample Test shall be conducted on one equipment from the first 10 produced.

4.4.2.1 Scope of Tests - As a minimum, each equipment selected for sampling tests shall be subjected to the following tests:

- (1) Complete operational test at ambient room conditions, making all necessary measurements to assure that all applicable specification requirements have been met.
- (2) Operational test at certain environmental conditions. The conditions may vary for each equipment tested and should be based on results of the preproduction, initial production, individual and special tests.
- (3) Manufacturing run in test specified in paragraph 4.4.1.3 except that the test duration shall be 120 hours with no restriction on the number of failures. However, each failure shall be analyzed as to cause and remedial action necessary to reduce the possibility of its recurrence in future equipment.

4.4.3 Reliability Assurance Tests - Reliability assurance tests shall be conducted as required by MIL-STD-781. Equipments selected for reliability assurance tests shall first have passed the individual tests.

4.4.3.1 Test Level - The Test Level shall be Test Level G from MIL-STD-781. During each cycle, the equipment shall be operated during the entire Heating Period

4.4.3.2 Accept-Reject Criteria - Test Plan V of MIL-STD-781 shall be used to determine the accept-reject criteria.

4.4.3.3 Length of Heat Portion of Cycle - After stabilization at the high temperature limit required by the test level, the equipment shall be operated four hours during each cycle.

4.4.3.4 Performance Characteristics to be Measured - Each of the performance characteristics listed below shall be measured at least once during each operating portion of the cycle, at a random time during the cycle. The equipment shall operate on its normal duty cycle during the test. Performance requirements shall be as follows:

<u>Characteristic</u>	<u>Performance Requirement</u>
RF Power Output	3 db below the limits of 3.3.3
RF Output Modulation	75 percent minimum
Receiver Sensitivity	3 db below the limits of 3.4.2.7.9
Receiver Audio Output	3 db below the limits of 3.4.2.7.4, 3.4.2.7.5, 3.4.2.7.6, and 3.4.2.7.11

4.4.3.5 Failure Criteria - In addition to the requirements of MIL-STD-781 the following requirements shall be used to determine when a failure has occurred during the test:

- (1) Whenever performance characteristics fall below the requirements of paragraph 4.4.3.4 at least one failure has occurred. If subsequent analysis reveals that several parts have deteriorated, each shall be counted as a failure, unless one caused the other parts to fail.

4.4.3.6 Preventive Maintenance - During the period of the tests, no preventive maintenance or readjustment of any controls which are inaccessible during flight may be performed.

4.4.4 Special Tests - Special tests shall be conducted on a quantity of equipments for the purpose of checking the effect of any design or material change on the performance of the equipment and to assure adequate quality control. The equipment selected for special tests may be selected from equipments previously subjected to the sampling or reliability assurance tests.

4.4.4.1 Special Test Schedule - Selection of equipments for special tests shall be made as follows:

- (1) On an early equipment after an engineering or material change.
- (2) Whenever failure reports or other information indicate additional tests are required. (This will be determined by the procuring activity.)

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4.4.4.2 Scope of Tests - Special tests shall consist of such tests as approved by the procuring activity. Test procedures previously approved for the preproduction tests shall be used where applicable. When not applicable, the contractor shall prepare a test procedure and submit it to the procuring activity for approval prior to conducting the tests.

4.4.5 Equipment Failure - Should a failure occur during either the sampling, reliability assurance or special tests, the following action shall be taken:

- (1) Determine the cause of failure.
- (2) Determine if the failure is an isolated case or design defect.
- (3) Submit to the procuring activity for approval, proposed corrective action intended to reduce the possibility of the same failure(s) occurring in future tests.
- (4) Where practical, include a test in the individual test to check all equipment for this requirement until reasonable assurance is obtained that the defect has been satisfactorily corrected.

4.5 Life Test - The contractor shall furnish all samples and shall be responsible for accomplishing the life test. The test shall be of 300-hours duration and shall be conducted on equipments that have passed the individual test. The life test shall be performed under the conditions specified in 4.5.1. The life test sample shall be selected by the government inspector in accordance with the following. (Equipments which have successfully passed the Initial Production Test, Sampling Tests, Reliability Tests, or Special Tests may be selected for life tests.) When reliability tests are conducted, the life test may be omitted if, during the reliability tests, a quantity of equipments equal to, or more than, that listed below receive at least 300 hours each of test time.

<u>Quantity of Equipments Offered for Acceptance</u>	<u>Quantity to be Selected for Life Test</u>
First 25	1
Next 175	1
Next 300	1

1 for each additional 500
or fraction thereof

4.5.1 Test Conditions - The life test shall be conducted under the following simulated service conditions:

Temperature	Normal room
Altitude	Normal ground (0 - 5000 ft.)
Humidity	Room ambient
A. C. Voltage	115 \pm 5 volts (at lowest applicable frequency)
D. C. Voltage	27.0 \pm 2.0 volts

4.5.2 Test Periods - The test may be run continuously or intermittently. Any period of operation shall be of sufficient duration to permit the equipment temperature to stabilize. Periodically, the equipment shall be turned on and off several times and put through its various phases of operation.

4.5.3 Performance Check - At approximately 8-hour intervals during the test, a limited performance check shall be made. The performance check proposed by the contractor shall be subject to approval by the procuring activity.

4.5.4 Test Data - The contractor shall keep a daily record of the performance of the equipment, making particular note of any deficiencies or failures. In the event of part failures, the defective part shall be replaced and the operation resumed for the balance of the test period. A record shall be kept of all failures throughout the test, including all tube failures. This record shall indicate the following:

- (1) Part type number
- (2) The circuit reference symbol number
- (3) The part function
- (4) Name of the manufacturer
- (5) Nature of the failure
- (6) The number of hours which the part operated prior to failure

4.5.4.1 Failure Report - In the event of a failure, the government inspector shall be notified immediately. A report shall be submitted to the procuring activity upon completion of the test. In this report, the contractor shall propose suitable and adequate design or material corrections for all failures which occurred. The procuring activity will review such proposals and determine whether they are acceptable.

4.5.5 Reconditioning of Life Test Samples - An equipment which has been subjected to the life test shall be reconditioned as follows:

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- (1) On completion of the life test, the equipment shall be reworked by the contractor by replacing all "wear" items. The "wear" items shall be determined by agreement between the contractor and the procuring activity.
- (2) After reworking, the contractor shall resubmit the equipment for acceptance.

4.6 Test Procedures - The procedures used for conducting pre-production tests, acceptance tests and life tests shall be prepared by the contractor and submitted to the procuring activity for review and approval. The right is reserved by the procuring activity or the government inspector to modify the tests or require any additional tests deemed necessary to determine compliance with the requirements of this specification or the contract. Specification MIL-T-18303 shall be used as a guide for preparation of test procedures. When approved test procedures are available from previous contracts such procedures will be provided and may be used when their use is approved by the procuring activity. However, the right is reserved by the procuring activity to require modification of such procedures, including additional tests, when deemed necessary.

4.7 Reconditioning of Tested Equipment - Equipment which has been subjected to acceptance and life tests shall be reconditioned by the contractor by replacing all wear or damaged items. After reworking the contractor shall resubmit the equipment for acceptance.

4.8 Presubmission Testing - No item, part or complete equipment shall be submitted by the contractor until it has been previously tested and inspected by the contractor and found to comply, to the best of his knowledge and belief, with all applicable requirements.

4.9 Rejection and Retest - Equipment which has been rejected may be reworked or have parts replaced to correct the defects and resubmitted for acceptance. Before resubmitting, full particulars concerning previous rejection and the action taken to correct the defects found in the original shall be furnished the government inspector.

5. PREPARATION FOR DELIVERY

5.1 General - All major units and parts of the equipment shall be preserved, packaged, packed and marked for the level of shipment specified in the contract or order in accordance with Specification MIL -E-17555.

6. NOTES

6.1 Test Values - Normal and limiting values of performance data shall be determined at input voltages of 27.5 ± 0.5 V DC and 115 ± 1 V AC as applicable. These data are to be used in testing the equipment at installation points for compliance with minimum acceptable standard of performance.

6.2 Performance Objectives - Minimum size and weight, simplicity of operation, ease of maintenance, and an improvement in the performance and reliability of the specific functions beyond the requirements of this specification are objectives which shall be considered in the production of this equipment. Where it appears a substantial reduction in size and weight or improvement in simplicity of design, performance, ease of maintenance, or reliability will result from the use of materials, parts and processes other than those specified in Specification MIL-E-5400, it is desired their use be investigated. When investigation shows advantages can be realized, a request for approval shall be submitted to the procuring activity for consideration. Each request shall be accompanied by complete supporting information.

6.3 Non-Repairable Subassemblies - As a general rule, non-repairable subassemblies should be encapsulated or hermetically-sealed. The number of connections internal to the subassembly should be held to a minimum. Detail parts tolerances and ratings should be so selected that the life of the subassembly is greater than that of a similar repairable one. With few exceptions (such as high voltage power supplies), the non-repairable subassembly should evidence a mean-time-to-failure greater than 5000 hours, and for many applications this figure must be nearer 50,000 hours.

6.4 Precedence of Documents - When the requirements of the contract, this specification, or applicable subsidiary specifications are in conflict, the following precedence shall apply:

- (1) Contract - The contract shall have precedence over any specification.
- (2) This Specification - This specification shall have precedence over all applicable subsidiary specifications. Any deviation from this specification, or from subsidiary specifications where applicable, shall be specifically approved in writing by the procuring activity.
- (3) Referenced Specifications - Any referenced specification shall have precedence over all applicable subsidiary specifications referenced therein. All referenced specifications shall apply to the extent specified.

6.5 The parentheses (*), when used in the type designation, may be replaced by either a number or letter furnished by the procuring activity upon application by the contractor for assignment of nomenclature in accordance with 3.2.8. The complete type number shall be used on nameplates, shipping records and instruction books, as applicable.

6.6 Ordering Data - Purchasers should exercise any desired options offered herein, and procurement documents should specify the following:

- (a) Title, number, and date of this specification.

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- (b) Selection of applicable levels of packaging and packing (see 5.1).
- (c) Design Data (see 3.5).
- (d) AC or DC Power Supplies

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).

SPECIFICATION

MIL-R-81217(WP) RADIO SET AN/ARC-101(*)

ORGANIZATION (Of submitter)

CITY AND STATE

CONTRACT NO.

QUANTITY OF ITEMS PROCURED

DOLLAR AMOUNT

\$

MATERIAL PROCURED UNDER A

DIRECT GOVERNMENT CONTRACT

SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

YES

NO IF "YES", IN WHAT WAY?

4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)

SUBMITTED BY (Printed or typed name and activity)

DATE